SAND DUNE SITES IN THE BAR AREA AND THEIR MAJOR MANAGEMENT ISSUES

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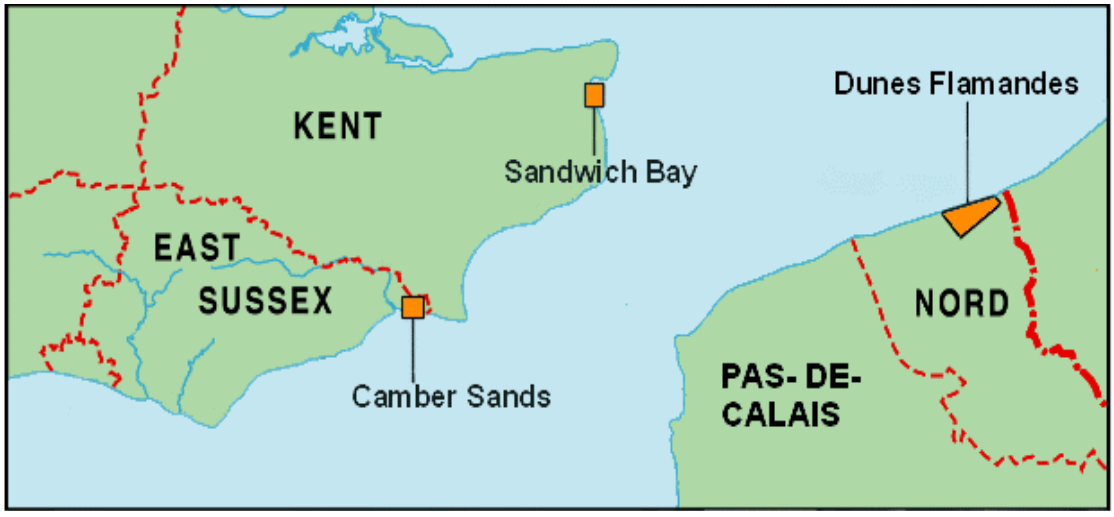
Introduction

The BAR Project (or Beaches at Risk) is a trans-boundary project which aims to identify and investigate threats to the coastlines of south-east England and north-west France, to assess the likely impacts of these threats and to advise on management strategies. Sand dune areas merit special attention as they are classified as Annex I Habitat types under the EC Habitats Directive. The protection of these sites and their biodiversity is therefore of international importance. In Britain their conservation has been implemented by the introduction of a Habitat Action Plan (HAP) for sand dunes and most are designated as Sites of Special Scientific Interest (SSSIs). In East Sussex and Kent the coastal sand dune habitat is represented at only three small sites: Camber Sands in East Sussex, Romney Warren and Sandwich Bay in Kent. The limited extent of this habitat type in these counties makes these sites very important for nature conservation. The coastal dunes of the French coasts of Nord-Pas-de-Calais and Haute Normandie are far more extensive and, as such, support a greater diversity of sand dune habitats, each with its own nature conservation significance. Many of the sites are owned and managed by the Conservatoire de l'espace littoral et des rivages lacustres (Conservatoire du littoral, for short), an organization set up in 1975 to protect France's marine and freshwater habitats. The areas of coastal dune included in this report are highlighted below (Map 1.) and a discussion of their priority management issues follows.



Map 1. The sand dune areas within the BAR area that are covered in this report.

Camber Sands, East Sussex, England

Camber Sands is a sandy beach bordered on its northern edge by a small dune system. It is the only sand dune habitat in East Sussex, and as such, is of high conservation significance.

Figure 1. The eastern side of the dunes at Camber. Source : http 1.

The sand dune system comprises a roughly wedge-shaped area which extends about 3 kilometers east of the mouth of the River Rother near the county borders of East Sussex and Kent. The western end of the dunes is largely stabilized and managed as a golf course by Rye Golf Club. The eastern end of the dunes is mostly dominated by an unstable yellow dune habitat and is owned by East Sussex County Council (Figure I.). Most of the dunes lie within the boundaries of the Camber Sands and Rye Saltings SSSI. The remainder of the dunes situated to the east of the system has been designated as a Site of Nature Conservation Importance (SNCI) so that the entire dune area is afforded some conservation status.

What Camber lacks in size, it makes up for in management problems. The dunes are bounded on the north-side by the village of Camber and their position provides essential flood defense for the village. However, as dunes are a naturally dynamic system prone to migration, and because the dunes at Camber are accreting, the residents of Camber village often find their roads and gardens bombarded with wind-blown sand. Dune erosion at Camber is not helped by the intensity of recreational visitors to Camber in the summer months. It is not uncommon for up to 20,000 people to visit Camber on any one day in summer (http 1.). A total of 35,000 visitors was recorded for a single day in July 1999. As there is little control of where the public is allowed to go within the dune system, this results in the trampling of the dune vegetation which is essential for dune stabilization. Destruction of the vegetation allows the sand that was previously bound by roots to become mobile again, therefore increasing erosion on the dunes.

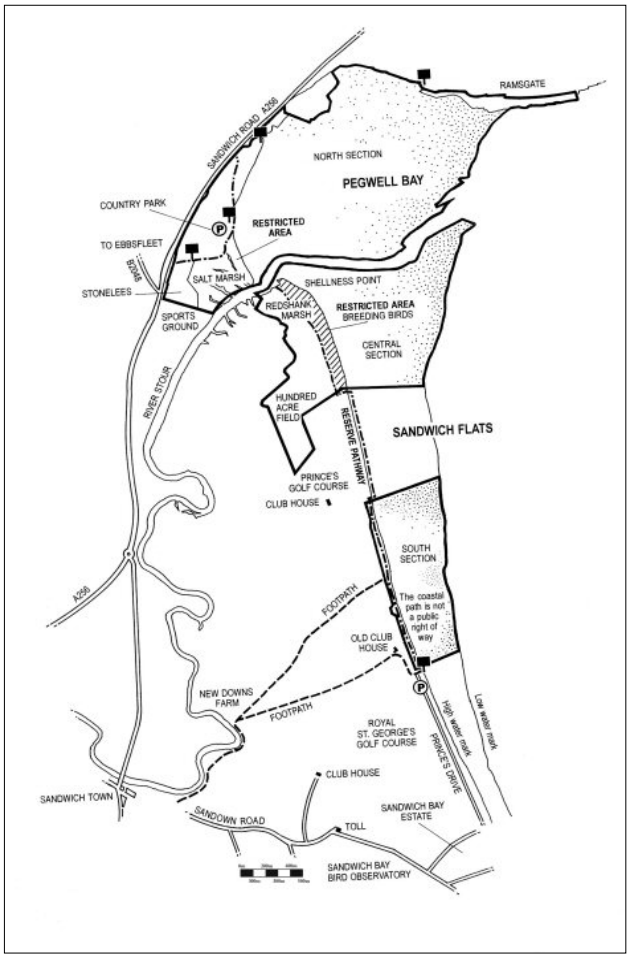
Attempts at dune stabilisation have occurred several times at Camber in the past. A major restoration and reseeding operation occurred in 1967 after a large extent of Camber's vegetation cover had been wiped out by the use of the dunes as an army training ground during World War II and further subsequent degradation by increased recreational use. Prior to this, the large-scale planting of *Hippophae rhamnoides* (sea-buckthorn) was carried out by Kent River Authority in 1951 to stabilize an area to the east of the golf course (Firth, 1971). *Hippophae rhamnoides* has proven to be a very successful dune

stabilizing species and, as such, has been introduced to many dune systems throughout Europe. However, the species became a problem in many dune systems in Britain after the 1950s when an outbreak of myxomatosis seriously reduced rabbit populations (Rooney, 1998). At Camber the sea buckthorn has invaded an area of fixed dune which could potentially support a grey dune habitat which is considered to be a priority habitat by the EC Habitats Directive. Removal of the sea buckthorn has been attempted here but only on the limited scale achievable by the use of hand tools and a small group of volunteers. The work done so far has been insufficient to clear the sea buckthorn permanently as the plant seems to regenerate very rapidly.

Sandwich Bay, Kent, England

The Sandwich Bay Dunes are situated to the south of the River Stour estuary between Sandwich and Ramsgate in Kent. Sandwich Bay itself is classified as a candidate Special Area of Conservation (cSAC) which means it is strictly protected under the EC Habitats Directive and UK Habitats Regulations 1994.

The entire cSAC area consists of 1138 ha of coastal habitats including mud flats, sand flats, salt marsh, shingle, and, of course, sand dunes. Nearly all of the dune habitats at Sandwich Bay are, in addition, protected under SSSI status. The majority of the dune system is stabilised and managed as three different golf courses which work closely with English Nature and Kent Wildlife Trust to protect the dunes. The SSSI at Sandwich Bay also includes areas that have been awarded Ramsar and SPA status. A large area of the dunes is included in the Sandwich and Pegwell Bay National Nature Reserve (see Map 2.). The reserve is jointly owned by Dover District Council, Kent County Council, Kent Wildlife Trust, National Trust, Pfizer Ltd, RSPB and Thanet District Council. However it is Kent Wildlife Trust that manages the reserve on behalf of this partnership



Map 2. The area and habitats of Sandwich and Pegwell Bay NNR. Source: http 2.

Kent Wildlife Trust has two major concerns regarding the dune system at Sandwich, the first of which being the migration of shingle from the south. In 1950 the beach at Sandwich Bay consisted of sand north of the Sandwich Bay Housing Estate and the shingle was limited to the south. Since this time the shingle has migrated north to the centre of the coastline parallel to the Prince's Golf Course creating a large area of stabilized dune fronted by shingle (see Figure 2.). Evidence from Kent County Council's aerial photographs clearly shows that the shingle is migrating northwards, possibly as a result of beach nourishment further south along the coastline at Sandown Castle. This is having the effect of a "coastal squeeze" on the dune system, aided by the diminished sand supply from the north which may have been caused by the extension of the harbour arm at Ramsgate.

Figure 2. Migrating shingle encroaches on dune vegetation at Sandwich Bay. Picture: the author 05/01/2005.

The second major threat to this dune system is rising sea levels as a result of Global Climatic Change. Obviously this issue is not confined to Sandwich Bay and all around the world decisions will have to be made about the protection of the coastline against rising sea-levels. At Sandwich Bay, the options look grim. An extension of the sea defence wall at Deal to the mouth of the River Stour has been suggested but this would stop the sand supply to the sand dunes and result in their degradation. The alternative is to build a construction in the style of the Thames barrier across the river and build up the current sea defence walls. This would exclude the dunes from the protected area leaving them open to the effects of rising sea-levels and increases in extreme weather events. The loss of the dunes would have an extremely detrimental effect on the populations of species that only occur at Sandwich Bay and a few other sites in Britain such as the Bright Wave Moth *(Idaea ochrata cantiata)* and the Rest Harrow Moth (*Aplasta ononaria)*.

Dunes Flamandes, Nord-Pas-de-Calais, France

Les dunes flamandes are situated east of Dunkirk in the extreme north of France next to the border with Belgium. They are currently owned by the Conservatoire du littoral but managed by Le Conseil Général du Département

du Nord. The area contains four principle dune sites (Dune du Perroquet, Dune Fossile Ghyvelde, Dune Marchand and Dune Dewulf) which together make up an area of 480 ha. The systems are largely made up of parabolic dunes that are created by the predominant winds from the east which build up the dunes parallel to the coastline until the occasional violent wind from the north creates a depression in the dune which eventually opens out into a flat area encircled on one side by the dune (see Figure 3.).

Figure 3. Parabolic dune of Des Dunes Flamandes. Picture: Marie-Hélène Ruz.

These parabolic dune systems support a variety of wet and dry habitats such as dune grassland, dune scrub, embryo dunes, yellow dunes, dune marsh and wet dune slacks (“panne”). This array of habitats, in turn, supports a rich species diversity (close to 400 plant species). Because of their value for wildlife, La Dune Marchand has been classified as a “Réserve Naturelle” and the entire dune area has been recommended as a candidate SAC.

Unfortunately these dunes too are under threat from the growing menace that appears to have spread on dunes all over Europe since the decline of the rabbit population. The Conseil Général du Nord estimates that 70% of the dune system is now covered in sea buckthorn (“l’argousier” in French). However, this is seen by French coastal managers not to be so much an invasion, as a natural seral progression from pioneer species to dune scrub consisting largely of creeping willow (*Salix repens*) and sea buckthorn. No matter which scenario is the truer representation of what is occurring, the fact remains that the scrub species are advancing into other valuable dune habitats at an alarming rate. This is particularly a problem for the wet dune “pannes” as sea buckthorn tends to lower the water table wherever it establishes, thus drying out moist habitats. Management initiatives on these dunes are, therefore, largely geared towards the clearance of the scrub but

without destabilizing the dunes as this could have a damaging impact on the surrounding urban areas (Conseil Général du Nord, 2002). Some experiments have been carried out at Dune du Perroquet that have involved 10 years of manually clearing areas of scrub. The clearance appears to have been successful albeit for small areas and labour intensive. Areas that were once covered in dense sea buckthorn have been transformed into dune grasslands which seasonally support vast populations of orchids. Recently, some clearance has been carried out on a larger scale using bulldozers. The recovery of the dunes after this type of clearance is being closely monitored. Following the clearance of certain areas, attempts at the restoration of wet dune habitats has been carried out, and grazing by ponies and sheep has been introduced in areas of the dunes to reinforce the effects of the recovering rabbit population.

What We Can Learn from Each Other

The foredune ridge of the dunes of the northern coast of France was seriously damaged by urban development at the start of the 20th Century and was subsequently further degraded during the Second World War. By the 1980s the foredune was threatened by blowouts, breaches and erosional scarps so, in the early 1990s, a restoration program was initiated by the Conseil Général du Nord in an attempt to stabilize the foredune (see Figure 4.). The measures included the installation of wooden and brushwood fences to accumulate sand and areas of bare sand were fenced off and planted with marram grass (*Ammophila arenaria*). Public access was restricted and information boards were put at the entrances of pathways in an attempt to give the public a better understanding of the sand dune environment. The dune topography has been monitored by the Coastal Geomorphology and Shoreline Management Unit of the Université du Littoral since 1996 and they have been able to show that coastal erosion has slowed down on this coastline and that foredune stability has been significantly improved (Ruz *et al*, in press).

The problems that were occurring on the foredunes of the northern French coast are not unlike the erosion that can be seen currently occurring at Camber Sands in England. Certainly there is scope for looking at the successful achievements of our French colleagues and implementing similar management practices at Camber Sands.

Figure 4. Foredune ridge of dunes of the northern French coast in June 1998 (left) with installation of wooden fences and marram planting recently occurred and in September 2001 (right) with marram fully grown and dune stabilised. Pictures: Marie--Hélène Ruz.

Gaps in Knowledge

It seems that sea buckthorn becomes a pest species almost everywhere it establishes itself in Europe. However, there are certain areas where, it is claimed, that the sea buckthorn has always been present but never invasive such as Sandwich Bay in Kent (Rogers, 1961). Why this should be the case is yet unknown. There is speculation about biological control by Brown Tail moths which undergo periodic population fluctuations (possibly caused by pathogen build-up) and the influence of the local rabbit population. Alternatively the factors keeping the sea buckthorn in check could be entirely abiotic and involving rates of sand accumulation or average dune ridge height. The truth, to this day, has eluded us but, if discovered, could have significance for sand dune wildlife conservation across Europe.

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